SMITHERS

Packaging Source Reduction

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PREPARED FOR

AMERIPEN®

CONSUMER BRANDS ASSOCIATION

CTA™
Consumer Technology Association, producer of CES®

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Introduction

The purpose of this study and white paper is to quantify the amount of U.S. based packaging at large that has been reduced by weight over the past decade and how much more may be realistically feasible.

As legislation moves to promote sustainable packaging objectives, source reduction is becoming an increasingly important topic. California has passed legislation requiring companies to reduce single-use plastic packaging by 25% by 2032. Several states with packaging-related extended producer responsibility legislation have identified packaging source reduction as a goal to be achieved shortly after implementation of their programs. Targets will vary and will be set by either the state regulatory agency or left to the producer responsibility organization (PRO) to identify.

Source reduction in packaging can be a difficult balance; too much reduction and a package lacks the integrity or structure needed to provide protection, so products get damaged or spoil. However, if there are opportunities to reduce, it means companies may be using more material and resources than needed—creating unnecessary costs and environmental impact. As a result, source reduction, also referred to as packaging optimization within the industry, is a longstanding objective by many packaging designers.

Source reduction is not a novel practice, as most companies have gone through great lengths to optimize their packaging over the last 20 plus years. These practices align with companies' sustainability goals, resonate with consumer preferences, and also save companies' costs by reducing the amount of material needed.

This study has been commissioned to help understand what has been done over the past decade and what reasonably may be accomplished over the next decade to achieve further source reduction in the packaging industry.

Context

The study was commissioned by AMERIPEN – the American Institute for Packaging and the Environment, CBA – Consumer Brands Association, CTA – Consumer Technology Association, and delivered by Smithers.

AMERIPEN — the American Institute for Packaging and the Environment — represents the entire packaging value chain, advocating for responsible packaging policies that drive meaningful progress in packaging sustainability while supporting industry growth and consumer needs. As the leading voice for packaging policy in the United States, AMERIPEN works with legislators, regulators, and stakeholders to develop science-based, data-driven solutions that enhance packaging's role in product protection and circularity.

CBA — Consumer Brands Association — champions the industry that makes the products you choose and the brands you trust. From household and personal care to food and beverage products, the consumer packaged goods industry plays a vital role in powering the U.S. economy, contributing $2.5 trillion to U.S. GDP and supporting more than 22.3 million American jobs.

CTA — Consumer Technology Association — is North America's largest technology trade association. Our members are the world's leading innovators – from startups to global brands – helping support more than 18 million American jobs. Our member companies have long been recognized for their commitment and leadership in innovation and sustainability, often taking measures to exceed regulatory requirements on environmental design and product stewardship

Smithers is the worldwide authority on the packaging industry organizing conferences, publishing market reports on the future outlook and supporting clients across the packaging value chain and conducting technical investigations.

Specific Project Objectives

- Quantify the efforts made by consumer brand companies and packaging converters to reduce material demand in packaging design over the past decade (in percentage and/or metric tonnage).
- Distinguish between category growth, material mix shift and packaging utilization to identify net packaging reduction.
- Quantify the anticipated efforts made by consumer brand companies and packaging converters to reduce material demand in packaging design for the next decade (in percentage and metric tonnage).

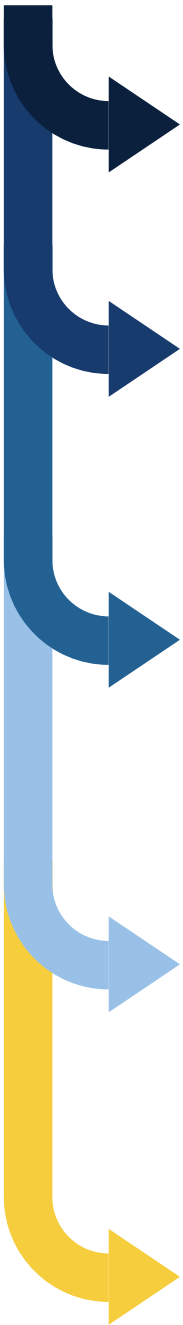
Measurements

Please note that the International System of Units (SI) and its associated abbreviations are used throughout the paper. Abbreviations used are as follows:

mg = milligram	t = metric ton
g = gram	Mt = megaton (one million metric tons)

Research Methodology

Smithers was commissioned by AMERIPEN, CBA and CTA to provide an independent and objective assessment of source reduction progress and outlook. In order to undertake this research Smithers deployed the following methodology:



Step 1: Kickoff

Smithers organized a kickoff conference call with the client to discuss key elements of the project. The main outcome of the meeting was to confirm and verify the nature of the information required.

Step 2: Desk Research

Smithers utilized its extensive existing packaging databases comprising of historic, current and future volume and value data segmented by end use and material type. This was combined with desk research from a wide range of other credible research sources including other industry databases, company reports, conference presentations, trade press, white papers and other useful insight on trends, key players and outlook

Step 3: Primary Research

100 interviews were conducted across the US packaging industry to gather data on source reduction efforts led by major brands and their supporting value chain. This focused on brand owners and packaging converters as brands typically drive the decision for packaging volumes and material choices and converters enable this and ensure its technical feasibility and performance. The data was collected and collated by Smithers under two-way anonymity and to ensure objectivity and protect confidentiality for industry participants.

Step 4: Delphi Technique[1]

All of the secondary and primary information generated in the first three steps were re-assessed using the Delphi research technique.

Smithers' forecasting unit, RADAR (Research, Analysis, Development and Review), consisting of market experts, moderated the research findings to ensure the highest possible degree of accuracy.

Step 5: Final Analysis

Using data collated from the first four Steps, Smithers provided a final set of estimates along with this report.

1. *The Delphi market research technique is an established method for moderating primary research. The technique is defined as "a method of forecasting technological and other events by analyzing the results of a questionnaire sent to a panel of experts who are therefore not subject to the inhibiting factors of a round table discussion"*

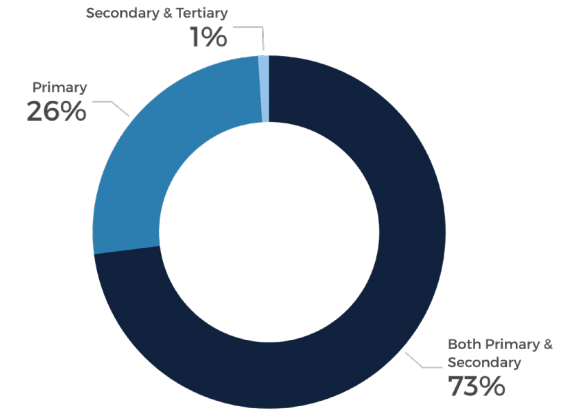
Smithers was tasked with collecting data from 100 companies across the broad packaging value chain to provide insight into the state of source reduction across the industry.

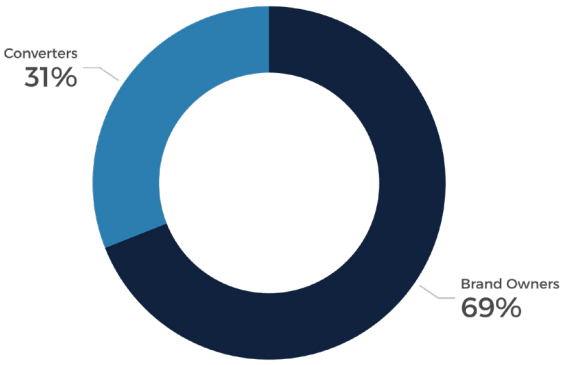
A focused, but diverse selection of job functions participated in the survey covering the whole value chain across the U.S., allowing a well-rounded consensus to the research.

Interviewees included the following job titles:

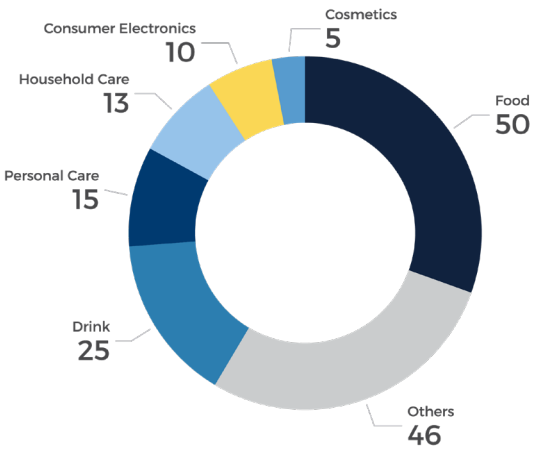
- Chief Supply Chain Officer
- Chief Operating Officer
- Chief Commercial Officer
- Chief Marketing & Innovation Officer
- Operations Manager
- Chief Growth Officer
- Brand Manager
- Senior National Accounts Manager
- Group President
- Manager
- Chief Sales Officer
- Operations Manager
- Head of Purchasing
- Chief Development Officer
- Plant Manager
- Sr. VP of Operations
- Zone President
- Chief Marketing Officer
- Product Development Manager
- Business Development Manager
- Chief Technology Officer
- Sales Manager
- Regional Operations Manager
- VP of Sales Development & Strategic Initiatives
- VP of Strategic Planning
- VP of Supply Chain & Customer Service
- VP of Technology & Marketing
- EVP of Processing, Solutions & Equipment
- Area Sales Manager
- Director of Sales & Business Development

Respondents by Supply Chain Function & Package Type





Number of Respondents by End-Use Segments*



**Some respondents identified themselves in more than one category*

For the purposes of this report, source reduction is be defined as the physical reduction of packaging weight from one pack format to a new pack format for a product with the same usage.

For the purpose of this analysis, source reduction percentage is defined as the net total packaging weight reduction per product serving/use. This includes material and design changes that result in less total packaging weight and excludes replacement with recycled or renewable material unless it reduces pack weight.

Examples of source reduction included in the analysis include:

- A company converts a plastic bottle from a 50 g bottle to a 45 g bottle through packaging design, reducing the package by 10%.
- A company changes the film structure of a flexible package, which allows the package to transition from 10 g to 8 g, a reduction of 20%.
- A company transitions its product from glass to plastic enabling them to transition from 100 g product to 25 g product, a 75% reduction.
- A company eliminates their single serve offering and transitions to a multi-serve option, which eliminates 20 g of flexible film for their 16 oz offering.
- A company modifies product formulation concentrating it by 50% and reducing packaging per use by 35%.

Source reduction initiatives not quantified in the study include a reduction in virgin materials (replacing with recycled content) and non-renewable resources (switching from petroleum-based to plant-based inputs). Also not quantified in this study is the introduction of a multi-serve format if single serve formats are still retained.

- A company incorporates 25% recycled content into an existing bottle design, where the bottle remains 50 g.
- A company transitions from a non-renewable material to a renewable material pack format that remains the same weight, e.g. 10 g to 10 g.

Category Definitions

Food

Fresh, frozen, chilled, dried, canned and preserved, ready meals, baked products, savory snacks, confectionery, dairy products, sauces, soups, pickles, oils and fats, baby food, pet food and hot beverages. Food packaging is defined strictly as consumer food packaging, basically, retail food packaging plus some packs used in food service that are the same as retail packs in terms of size and so on (e.g. small portion control pots of milk are not included in consumer food as these are food service specialties).

Drinks

Soft drinks (bottled waters, still and carbonated soft drinks, juice and juice drinks, dilutable drinks and nectars, sports and energy drinks, ready-to-drink (RTD) teas and coffee) and alcoholic drinks (beer and cider, wine, spirits and FABs – flavored alcoholic beverages).

Personal Care

Skin care, sun care, hair care, bath and shower products, antiperspirants and deodorants, shaving products, depilatories, oral care, associated gift sets and so on.

Household Care

Household cleaners, laundry detergents, fabric conditioner, dishwashing products, surface care products, air fresheners, toilet care, bleach and polishes.

Consumer Electronics

Mobile devices, wearables, TVs, set top boxes, monitors, laptops, tablets, computers, appliances & white goods, computers, printers, and scanners.

Cosmetics

Fragrances, color cosmetics, makeup, etc.

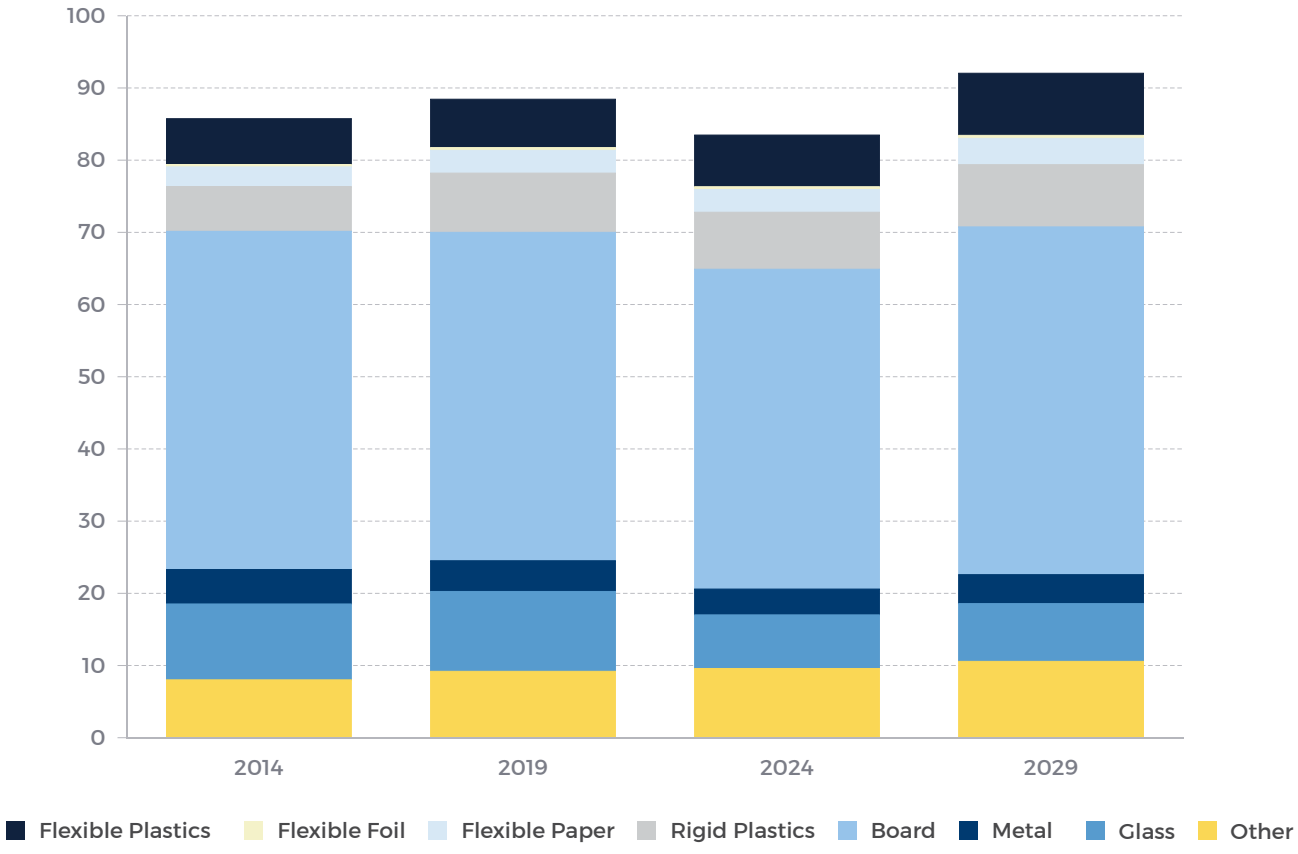
Executive Summary

On behalf of AMERIPEN, Consumer Brands Association and Consumer Technology Association, Smithers has undertaken a comprehensive primary and secondary research project to assess the impact of source reduction initiatives on US packaging volumes over the last 10 years and to forecast the potential outlook for packaging volumes to 2029. For the purposes of this white paper, source reduction includes material and design changes that resulted in less total packaging weight and excludes replacement with recycled or renewable material unless it reduced pack weight. This paper also identifies the key challenges to further source reduction and provides recommendations on how to achieve the optimal balance between source reduction and wider sustainable packaging goals.

In 2014, packaging volume in the US was 85.8 million metric tons. By 2019 this had grown to 88.4 million metric tons but by 2024, a range of source reduction initiatives and other factors had decreased packaging volume to 83.5. million metric tons from 2019 levels, despite a population increase of nearly 10 million people and the shift towards e-commerce created by the Covid-19 pandemic. Smithers estimates that without industry source reduction efforts, packaging volume would have reached 88.9 million metric tons by 2024 demonstrating a total volume reduction of 6.1%

Further source reduction may be possible but will require significant innovation and development given the long-term progress already achieved and further population growth in the US by 2029. Companies interviewed for this study believe that a further 5-10% source reduction is attainable but are conscious of significant challenges and limitations to achieving more than a 10% reduction. In addition, quantifying and tracking source reduction is a key challenge in its own right. Smithers estimates that packaging volume will reach between 82 million tons and 92 million tons by 2029 based on forecasted population, GDP and e-commerce growth.

US Packaging Volume 2019-2029 by Material Type (In Megatons)‡



‡Source: *Smithers*

Source Reduction

in the context of sustainability and other packaging trends

Historically, source reduction has been a central design strategy to improving efficiency and cost competitiveness. As sustainability has grown in focus, awareness and priority, source reduction has become one of the key methods for brands to achieve their stated sustainability goals. Moving forward, source reduction will need to be balanced with a range of other sustainability priorities.

Responding to Retailers, Creating the Goals, Achieving Compliance

2014-2019

In 2014 packaging demand in the US was 85.8 million metric tons. By 2019 this had grown to 88.4 million metric tons, primarily driven by population growth and subsequent consumer demand for packaged goods, and over this period a range of sustainability initiatives and priorities were beginning to emerge:

- A range of economic and environmental factors including growing consumer awareness increasingly influenced packaging decision making
- Large retailers like Wal-Mart set sustainability targets for their supply base to achieve
- Companies made significant progress on lightweighting opportunities and set broad sustainability goals

2019-2024

In 2019 packaging demand in the US reached 88.4 million metric tons but by 2024 this had decreased by 6% to 83.5. million metric tons despite a population increase of nearly 10 million people. Throughout this period the industry underwent a significant transformation in response to internal goals like sustainability-related ones and external factors like the Covid-19 pandemic and subsequent supply chain disruption:

- Companies responded to heightened consumer awareness and demand with dedicated sustainability goals and initiatives
- Improving recyclability, increasing use of recycled content and reducing use of virgin plastic became a primary focus for a growing number of brands and converters
- The first packaging EPR laws were passed in the U.S., some of which included source reduction requirements

2025

In 2025 US packaging demand is estimated to reach 85.1 million metric tons representing a modest increase on 2024's demand of 83.5 million metric tons. As consumer brands set new goals to 2030, the industry is addressing sustainability in new ways and with renewed focus:

- Increasingly stringent and complex regulatory environment globally incorporating mandates, fees and bans
- Companies continue to look for solutions to packaging waste with a focus on recycling, composting, reuse and refill options where feasible
- Post-consumer recycled content adoption continues to increase in plastic, and a range of novel innovations are being piloted in fiber based packaging
- The recycling industry is investing in a range of technologies to increase throughput, percentage rates and economics for recycling a range of materials

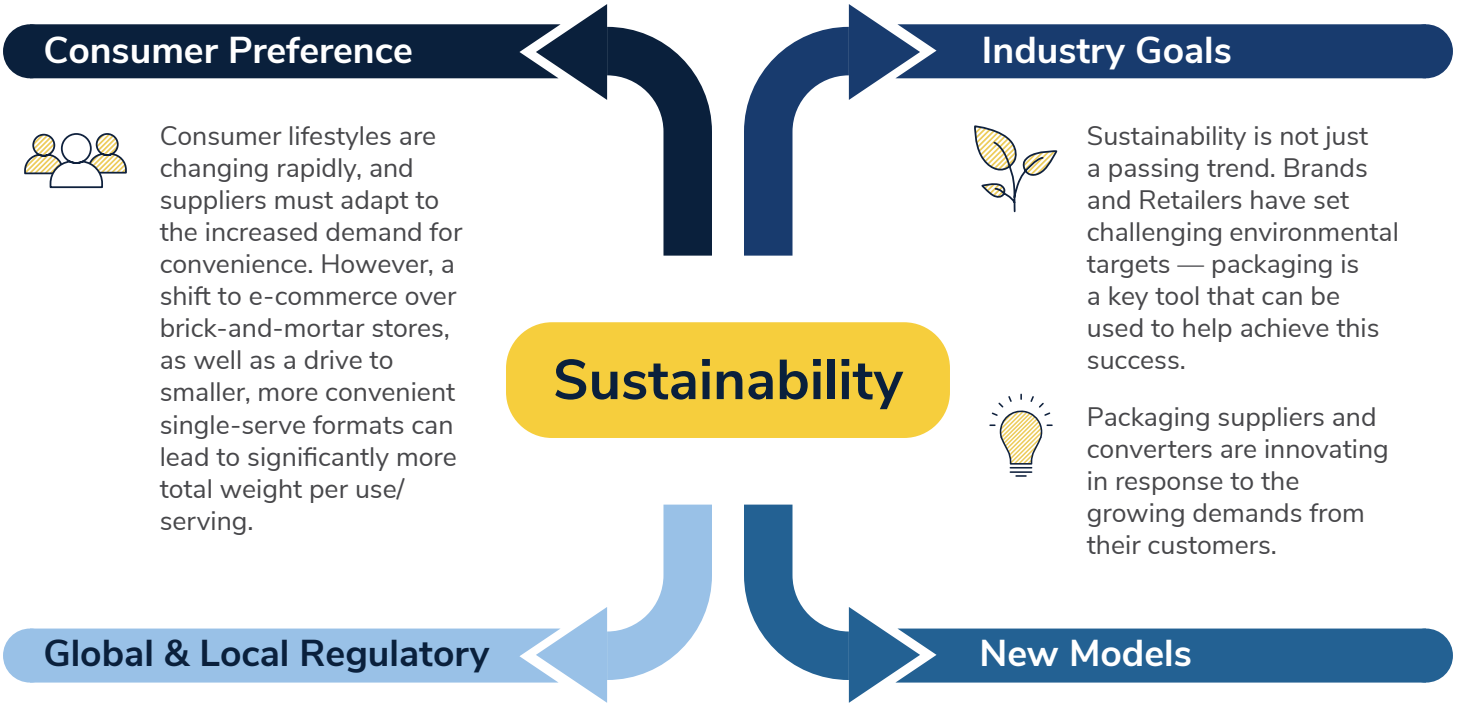
2026-2029

Between 2026 and 2029, the US population is forecast to grow to 347 million (source IMF). Smithers forecasts packaging demand by 2029 will be between 82 million metric tons and 92 million metric tons based on forecasted population, GDP and e-commerce growth. The industry will progressively address a range of sustainability challenges including source reduction to meet consumer demand and effectively minimise environmental impacts. Consumer preference, package performance, regulatory landscape, and cost will continue to drive packaging choices:

- More companies will evaluate the sustainability of both their products and their operations and set targets which balance consumer demand for product sustainability with consumer demand for convenience and low cost
- Circularity will be an established part of packaging considerations but carbon emissions will be an increasingly important factor; anticipate there will be trade off and compromise between these. Managing these complex trade-offs within an inconsistent regulatory landscape will be increasingly challenging
- Life cycle analyses will be increasingly complex and certification initiatives focused on carbon footprint will influence packaging choices
- Regional variations, inconsistencies and uncertainty will make brands more cautious and add complexity

Sustainability is at the heart of packaging companies' responses to a dynamic landscape of broader drivers and trends.

Consumer trends and drivers like e-commerce can provide headwinds and challenges for source reduction to ensure the packaging can withstand increased last mile delivery demands.



Trends

Companies continue to prioritize consumer preference, but regulation and policy is quickly becoming a key consideration introducing new complexities.

What are the primary drivers for your sustainability goals?

Brand owners and their supporting value chain have a wide range of goals to meet for a wide range of stakeholders and these goals are not always aligned.

Brand Responses

"Our corporate aim is a significant reduction in emissions by 2030. Included within that is a big drop in the overall volume of materials we're using — via new and innovative design work and taking advantage of more efficient transporting methods."

— MARKETING MANAGER, FOOD BRAND

"Achieving greater circularity in our operations."

— CEO, PERSONAL & HOUSEHOLD CARE BRAND

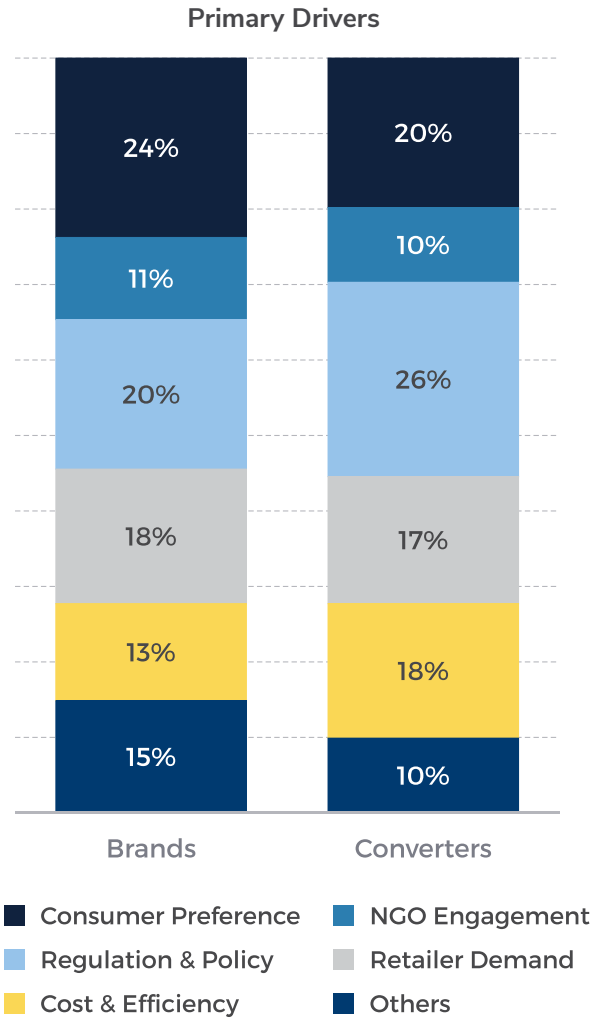
"Changing the virgin plastic to the recycled plastic."

— OPERATIONS MANAGER, DRINK BRAND

Converter Responses

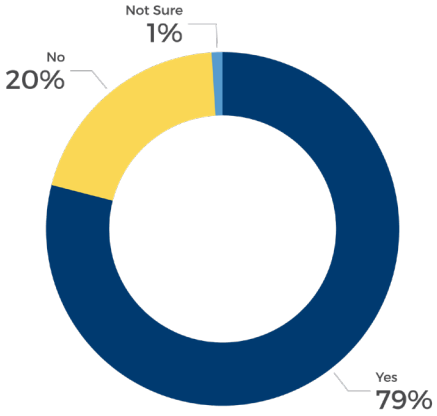
"We are growing our involvement in ecological and social programs."

— PRODUCT DEVELOPMENT MANAGER, CONVERTER

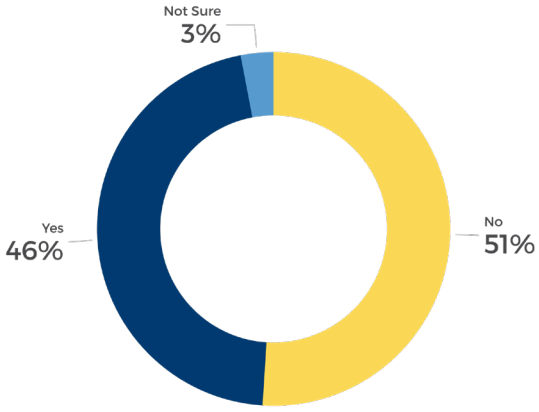


Nearly 80% of companies surveyed are tracking their source reduction and have been doing so for some time. Companies are working on the accuracy and sophistication of these processes, with less than 50% having automated systems to track data.

Do you track and measure source reduction?



Do you have an automated way of capturing this data?



Tracking source reduction has been a challenging journey for many companies due to the wide range of operations, packaging SKUs and materials used for large global organizations. Additionally, design changes can occur across the value chain amongst different players so tracking this can be a challenge.

Achieving harmonized processes for collecting meaningful and actionable data has involved investment and planning that is now starting and beginning to yield clearer and better insight into the overall net source reduction impact of brand, product and country level packaging decisions. Mandated annual reporting will need to carefully consider definitions, boundaries and sources to ensure data collection is not double reported and is consistent across states, pack formats and product categories to ensure that the data collected is valid.

Companies are balancing the data they have with the data that will be required by some states, and there are significant gaps between the two. European, Canadian and other international EPR programs do not require the level of detailed reporting that is in some state laws. As the granularity of materials becomes more detailed with greater material categories and reporting is being required on a component level, companies are struggling to rapidly implement more complex reporting practices into their systems – which takes great time and effort from multiple levels of the business – sometimes across time zones, continents and multiple languages. While future reporting will be challenging but potentially doable, lookback reporting is sometimes impossible.

Company Responses

“At a general level, we do [track]. We're working with our suppliers to get better and improve our packaging profile.

— COSMETICS BRAND

"We only have confidence in our source reduction numbers that have been reported within the last two years. This is primarily due to data collection processes, assumption evolution, and closer partnerships with packaging vendors.”

— PACKAGING MANAGER, FOOD BRAND

Companies are increasingly prioritizing recyclability as their most important sustainability priority in response to consumer and regulatory focus.

What is the most important sustainability priority for brands?

Improving recyclability is the top priority for packaging companies, according to the survey responses. This is driven by an understanding of the environmental benefits of material reuse as well as legislation such as EPR, which incentivizes recyclability and use of recycled content. Source reduction is the second most important issue but can be in conflict with recyclability. Brands may be restricted in their material choice, which may limit pathways to optimize source reduction while maintaining recyclability based on today's infrastructure and market access.

At the same time, regulatory requirements for recycled content are pushing brands to test the limits of packaging integrity. In some cases, increased recycled content may also require the use of more or heavier virgin material to achieve packaging integrity. This becomes a direct conflict with source reduction goals, forcing potential trade-offs.

Brand Responses

"The aim is for 100% recyclable materials, this year or next. One important step for us is to replace all PVC materials soonest."

— OPERATIONS MANAGER, FOOD BRAND

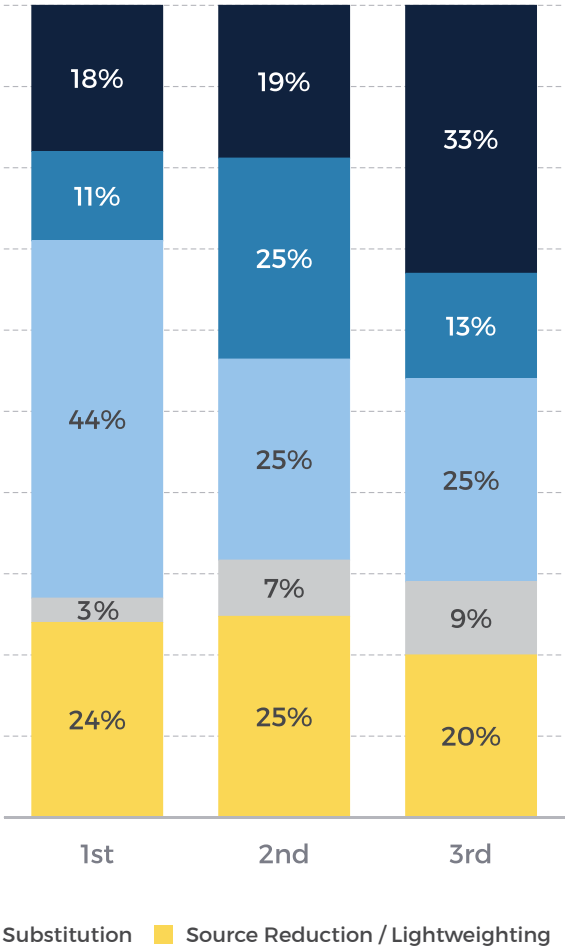
"Injecting ecological design principles into all of our packages."

— EVP, CONSUMER ELECTRONICS BRAND

"We're very focused on increasing circularity — that is, keeping materials in use for longer and possibly in multiple ways within the business — that way keeping them out of any landfill situation."

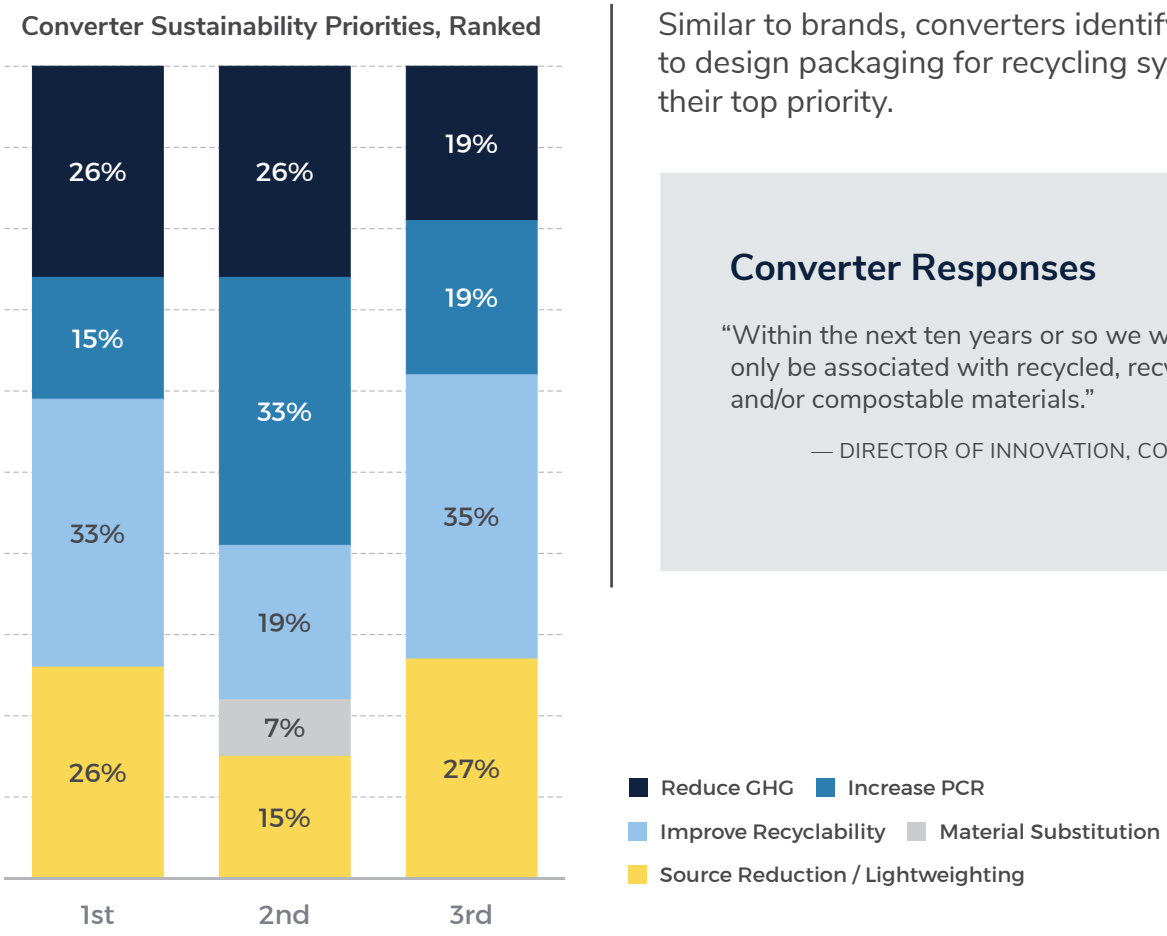
— SUSTAINABILITY DIRECTOR, FOOD BRAND

Brand Sustainability Priorities, Ranked



Converters are increasingly prioritizing recyclability as their most important sustainability priority in response to consumer and regulatory focus.

What is the most important sustainability priority for converters?



Similar to brands, converters identify the need to design packaging for recycling systems as their top priority.

Converter Responses

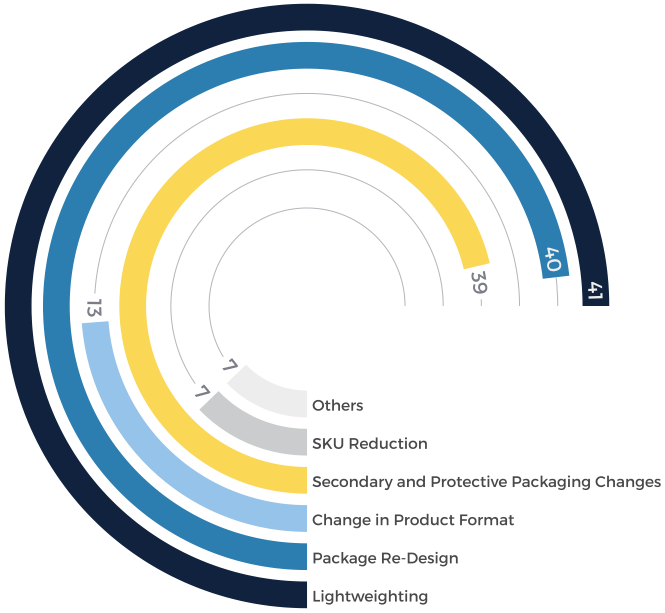
"Within the next ten years or so we want to only be associated with recycled, recyclable and/or compostable materials."

— DIRECTOR OF INNOVATION, CONVERTER

Companies have successfully deployed a wide range of effective source reduction initiatives and are concerned about how much more is possible.

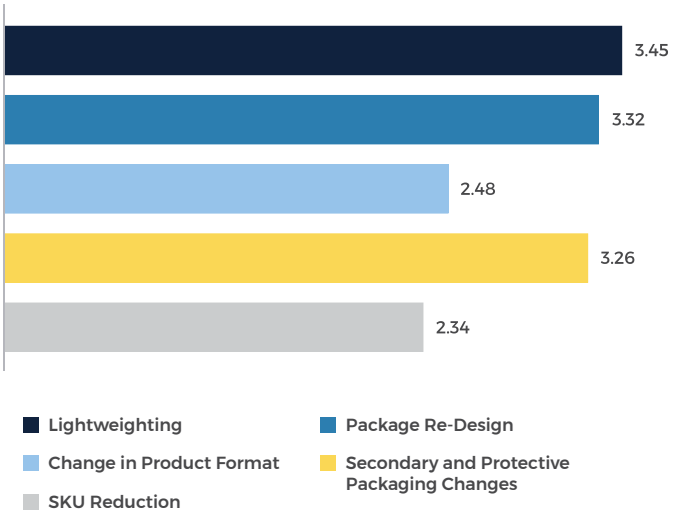
Source reduction is an objective that can be achieved through multiple strategies. A company may be able to switch or reduce the amount of material it uses in primary, secondary, and/or tertiary packaging. It may also be able to change the format of the package and/or redesign the product to streamline the packaging or amend the serving size (although this may not always be possible depending on the product). Understanding the primary strategies used by companies to drive source reduction helps identify where opportunities exist, especially as there are a range of different end-use requirements and no one-size-fits-all solution for source reduction.

Current Source Reduction Initiative Projects by Type (Among those Surveyed)

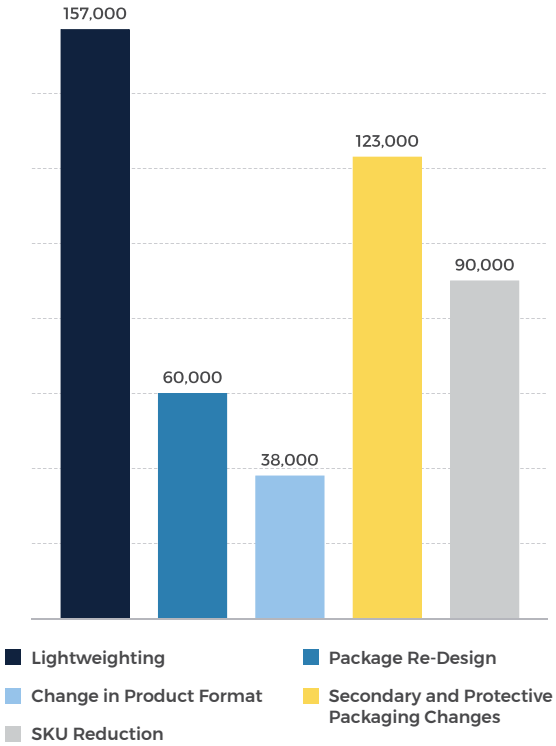


Perceived Impact these Initiatives had on Overall Source Reduction (Averaged)

1= Not Relevant 2= Somewhat Relevant 3= Very Relevant 4= Critical



Impact of Source Reduction Initiatives (Among those Surveyed) (in Metric tons)



Brand Responses

"We're proud of the fact that, over 9 years, we've reduced the average weight of our own-brand product packs by around a third."

— PACKAGING MANAGER, CONSUMER PRODUCTS BRAND

"Some of our own customer research shows that customers would appreciate smaller versions of many of our products, which we intend to go ahead with."

— COSMETICS BRAND

Converter Responses

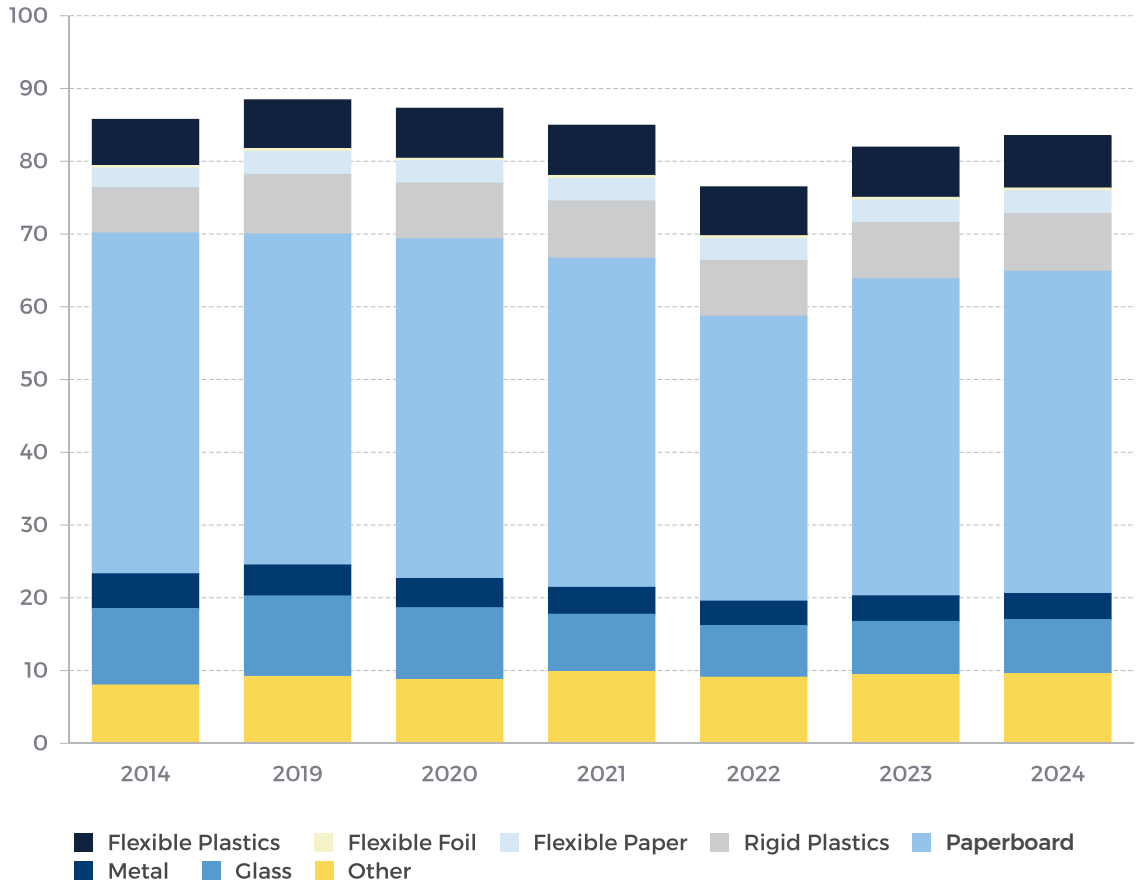
"We have already lightweighted as much as possible due to cost and customer pressure to reduce costs."

— CORPORATE AFFAIRS, CONVERTER

Historically, lightweighting has been the primary strategy through which companies have attempted to tackle source reduction. Using less material or switching materials to lower weight options has been the primary driver for packaging across all three levels of packaging (primary, secondary and tertiary).

Product redesign is the least applied strategy, an unsurprising finding since it's not always possible and requires product designers and packaging vendors to work together. These efforts tend to result in longer innovation time frames due to the complexities of the changes required.

Packaging Material by Use (In Megatons)

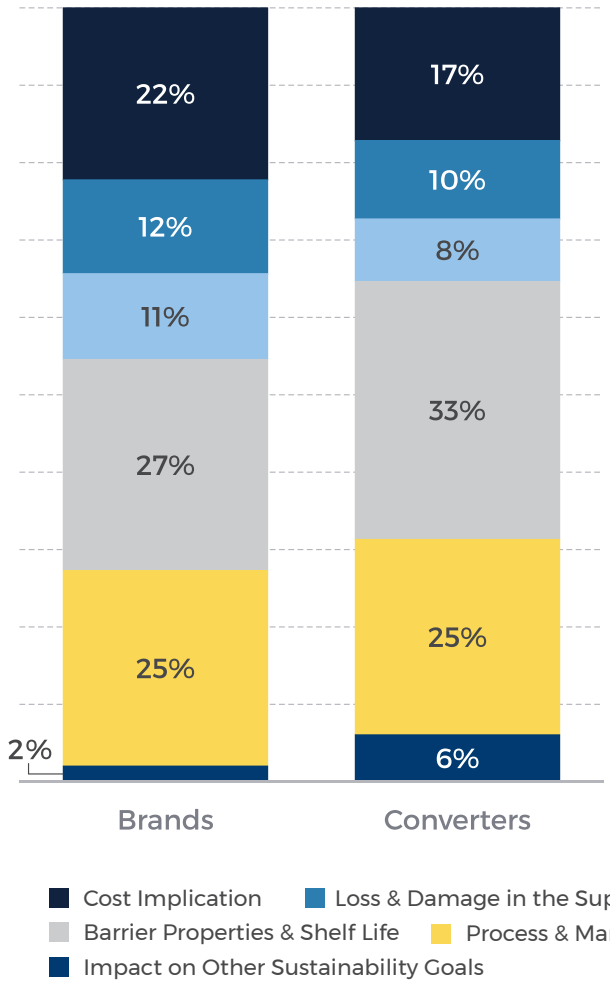


The material makeup of the packaging industry shows minor shifts in material usage. This may be attributed to a variety of reasons, such as growth in e-commerce, packaging innovations and recyclability.

Challenges & Limitations

Brands and converters must reconcile source reduction with maintaining package integrity in order to safely deliver products to consumers.

Which challenges have the biggest impact on source reduction?



Product protection is the primary function of packaging. Materials need to ensure they are robust enough to survive both traditional and e-commerce supply chains, especially for higher value and more fragile products like consumer electronics. Overly reduced packaging can lead to increased product damage and waste.

New materials need to protect consumer safety and maintain or improve barrier properties. Reducing shelf life and increasing food waste will have a significant detrimental environmental impact, if the packaging does not function as intended.

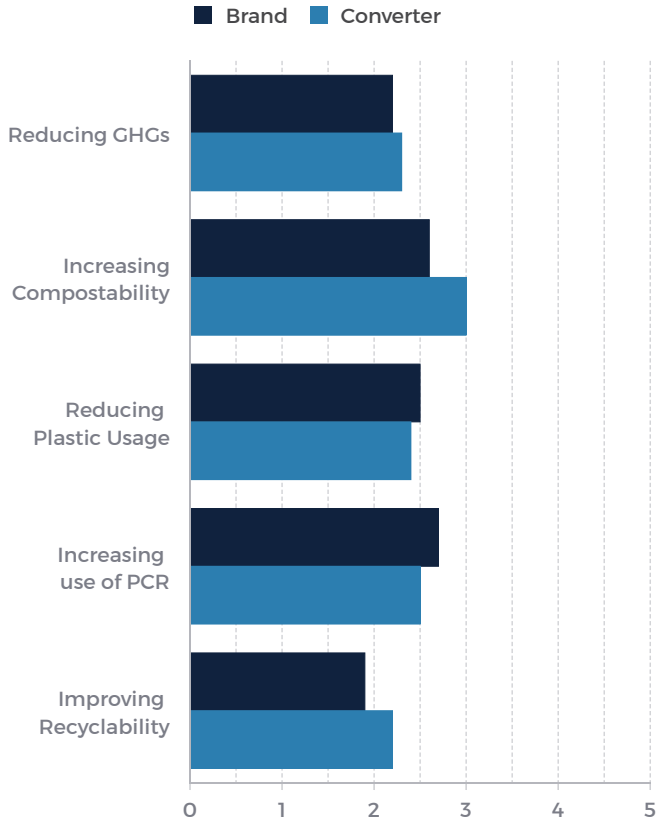
Rising costs throughout the supply chain remains a challenge; increases in raw material costs may be passed on to consumers who are already dealing with inflationary pressures.

Other sustainability goals such as reducing GHG emissions, improving recyclability, and increasing PCR content can be competing priorities and potentially run counter to source reduction efforts, making source reduction more challenging.

Further source reduction must be carefully evaluated to prevent significant price pressure for consumers and to mitigate the risk of waste from either damaged product or over packaging in the supply chain.

Improving packaging sustainability requires a complex balance of competing objectives to optimize environmental outcomes. Progress towards overarching sustainability goals can create challenges for source reduction.

Where do challenges for source reduction arise during progress toward overarching sustainability goals?



Companies are focused on reducing their overall carbon footprint which considers packaging but also all other aspects of manufacturing and distribution.

Source reduction needs to be evaluated for wider implications across the product journey.

Compostability is an important pathway for reducing food packaging going to landfills. However, these materials may be thicker or heavier than non-compostable alternatives, which challenges source reduction efforts.

Reducing plastic with other materials may mean reversing the lightweighting progress of the past by switching to potentially heavier non-plastic materials.

In some cases, using recycled content to achieve mandated PCR requirements may lead to higher grammage to achieve the same performance.

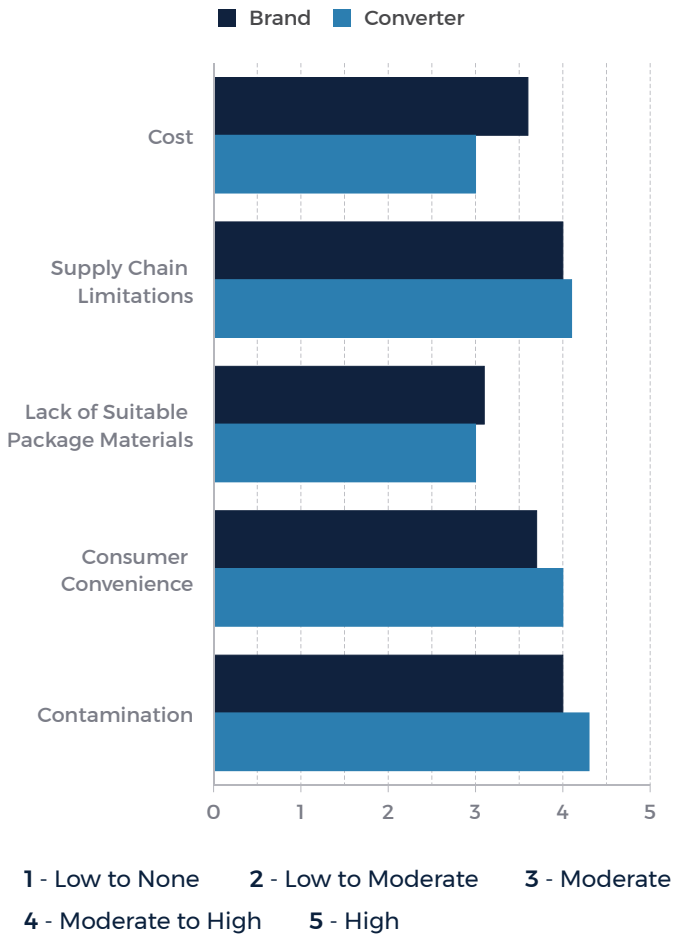
Improving recyclability can mean moving away from lighter weight, less recyclable materials.

1 - Low to None **2** - Low to Moderate **3** - Moderate **4** - Moderate to High **5** - High

Brands and converters may face tough choices as they balance source reduction strategies with other sustainability goals.

Refillable and reusable packaging initiatives have proved very challenging for companies to implement across a range of sectors.

What are the main barriers to further use of refillable and reusable packaging as a strategy for source reduction?



Brand Responses

"It's one thing people bringing in their own coffee cup, which does happen informally in our restaurants anyway, but quite another to ask us to place food in a container and package that isn't ours. Contamination uncertainties would abound, for sure."

— REGIONAL IMPACT OFFICER, FOOD BRAND

"We worked for two years on reusable packaging model and there was no path to profitability."

— SUSTAINABILITY DIRECTOR, FOOD BRAND

Converter Responses

"It is easy to make protective packaging that is strong enough to be used many times, but it costs more than lighter weight, less durable materials."

— DIRECTOR, CONVERTER

While refillable and reusable packaging is considered by some as a viable option to source reduce packaging, the survey results show moderate to high barriers for its implementation. Given the high number of respondents in the food and beverage sectors, it's no surprise that contamination was identified as a top challenge. And, given that supply chain limitations would be applicable in any packaging sector, it was highlighted by many. A more in-depth examination of where refill and reuse options could succeed is needed, given these challenges.

Case Studies

Companies continue to find new and innovative ways to source, reduce, and optimize their packaging to build on the progress they've already made.

Packaging companies across the value chains deploy a wide range of different approaches to source reduction to balance sustainability objectives and product performance to achieve the lowest weight packaging viable for each application. Examples of source reduction initiatives recently or currently deployed include:

Lightweighting

Coca-Cola has continued to lightweight its plastic bottle portfolio, and Diageo has taken innovative new steps to reduce the weight of its glass whiskey bottles.

Material Shift

Paboco and Blue Ocean Closures have enabled a reduction in weight for bottles while also switching from plastic to paper.

Secondary & Protective Packaging Reduction

Amazon and Zalando have reduced use of protected corrugated boxes by deploying flexible paper mailers, and Lenovo has reduced paper and plastic weights in bulk packaging.

Refillable & Reusable Packaging

Unilever and Henkel have reduced overall packaging usage by deploying refillable packaging options in some product categories.

Lightweighting

Coca-Cola

Coca-Cola lightweights its plastic bottle portfolio (USA)

Coca-Cola reduced the bottle weight from 21 g to 18.5 g for its 12, 16.9, and 20 oz sizes — a 12% source reduction. That change is anticipated to reduce PET consumption by 3 Mt by 2025.

This is the first update to Coca-Cola's bottle design since 2006, which at the time was a reduction to 21 g from 27 g.

Lightweighting

Diageo

Diageo explores two paths to lightweighting (UK)

Diageo unveiled the world's lightest 70cl Scotch whiskey glass.

The empty bottle without closure checks in at 180 g, where comparable sizes can be around 580 g.

While this launch was limited to 888 bottles, the knowledge learned in the process is being applied across the whole brand portfolio.

https://www.coca-colacompany.com/media-center/coca-cola-north-america-debuts-new-lightweight-pet-bottle-designs

https://www.johnniewalker.com/en-us/johnnie-walker-blue-label-ultra

Material Shift

Paboco and Blue Ocean Closures

Paboco and Blue Ocean Closures collaborate to deliver an industry-first paper bottle with fiber cap (Europe)

The entire package, including cap, has a total weight of less than 16 g, with an HDPE barrier weighing below 2 g.

A comparable plastic bottle is expected to weigh between 24 g and 35 g.

Secondary & Protective Packaging Reduction

Zalando

E-commerce source reduction initiatives (Europe)

Zalando has shifted the majority of its portfolio to paper bags, citing the benefits as:

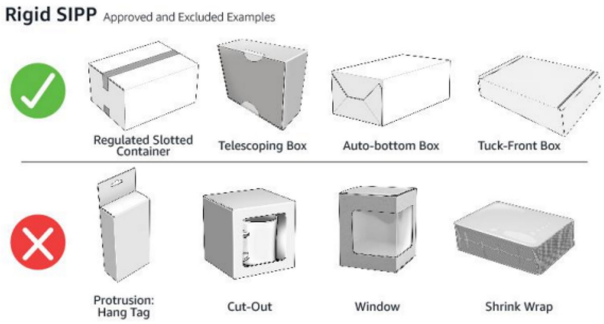
- Not needing to stock multiple sizes of packaging
- Reducing the need for manual filling and handling of orders
- Less packaging material waste as packaging is made to size
- Reducing void space

https://www.paboco.com/bottle
https://www.petainer.com/pet-plastic-bottles/soda-bottles/500ml-soda-bottle-28mm-pco-1810

Amazon

Amazon moving to “ships in product packaging” program where possible (USA & Europe)

Secondary & Protective Packaging Reduction



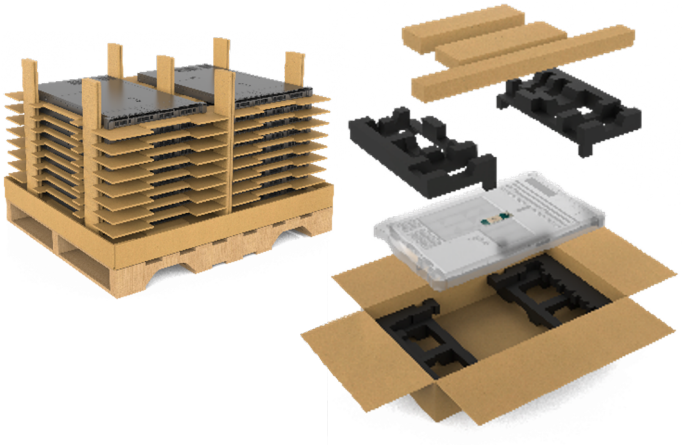
Like nesting dolls, packaging is usually done in three stages: primary, secondary and tertiary. This system was developed primarily for retail purchases, and each stage has its own purpose and requirements. The “Ships in Product Packaging” (SIPP) program reduces the need for three layers of packaging by shipping straight to the consumer; primary or secondary packaging can be removed with tertiary packaging taking on a more graphic design and/or written guidance. This strategy reduces the overall material used by reducing a level of packaging.

Additionally, Amazon identified corrugated boxes weren’t a one-size-fits-all. The company embraced the idea that flexible paper-based packaging could be used for orders not requiring product protection. Corrugated boxes have progressively been replaced by flexible, paper-based mailers, which also offer greater levels of sizing flexibility resulting in right-sized, lighter-weight packaging.

Lenovo

Lenovo Infrastructure Solutions Group (ISG) reducing paper and plastics weights in paper and plastic secondary packaging (USA)

Secondary & Protective Packaging Reduction



Lenovo strives to use smarter solutions to ship its products. Two examples include reducing carton volume for individually packaged servers, as well as a bulk packaging solution for multiple servers being shipped at once.

In the case of the individual server, the carton packaging volume has been reduced by 17% since 2024, due to the switch from EPE cushions to LDPE inserts made from a mixture of Ocean Bound Plastics and Post-Industrial Recycled Content. Therefore, more Lenovo servers can be included in a single shipping container.

When the bulk shipment solution is utilized by customers, paper usage is reduced by 61% in a per unit basis. As the only use of plastic in the bulk packaging solution are protective bags, plastic use is reduced by a significant 93% per unit.

https://cdn.amazon-packaging.com/a2/67/3b17139347c78ca4fb548790e9f8/fba-seller-amazon-sipp-program-certification-guidelines-20231114.pdf?initialSessionID=135-3144011-2918148&ld=NSBing

Refillable & Reusable Packaging

Henkel

Henkel introduces refill at home system to reduce packaging material.

The body of the pump dispenser is made of 100 percent recycled plastic.

The refill pouch, made from recyclable polyethylene mono-material, saves 70 percent plastic when compared to the Pril Stark & Natürlich pump dispenser.

Refillable & Reusable Packaging

Unilever

Unilever launches refillable deodorant for Dove

New format achieved a 54% packaging reduction made from 100% recyclable stainless steel.

The new innovation took 2 years to develop and is the first in this product category.

https://www.henkel.com/press-and-media/press-releases-and-kits/2022-02-03-the-new-pril-stark-natuerlich-environmentally-friendly-dishwashing-and-sustainable-packaging-1575458

https://www.dove.com/us/en/stories/tips-and-how-to/sweating-tips/introducing-our-first-refillable-reusable-deodorant.html

Future Outlook

Industry continues to pursue source reduction objectives, but the majority of U.S. companies surveyed foresee more than 10% source reduction as being unattainable.

What percent source reduction do you think is feasible in the next 5 years?

Brand Responses

"Well, I want to be optimistic with you - let's put something out there that's a bit of a stretch and go for it, is more our style."

— PACKAGING MANAGER, CONSUMER PRODUCTS BRAND

"Further innovation and the further investment that go with [source reduction] need time."

— SVP, CONSUMER ELECTRONICS BRAND

"I don't want to be pessimistic by giving you that low band, just to be cautious and to make the point that this isn't easy. Especially if we say that everything has to be verified and monitored and measured. We're not there yet, in such a precise manner."

— REGIONAL IMPACT OFFICER, FOOD BRAND

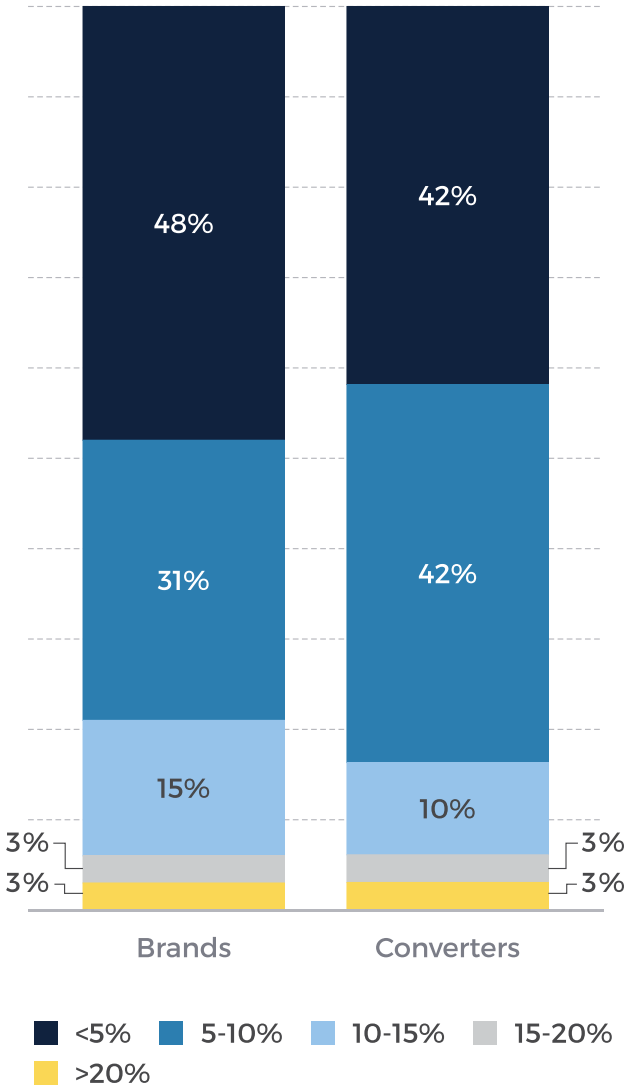
Converter Responses

"I'd like to give you a high percentage than that - but between governments who have multiple priorities and industry that's not going to do a lot of things that cost more, it's going to be a stop-start journey for some time yet."

— REGIONAL OPERATIONS MANAGER, FOOD BRAND

"Let's say we'd like to see it higher, but at least if, for the moment, we get there, to a 5% level, that's a start. More could be possible, but let's have reasonable aims to begin with, is our own approach to it."

— TECHNOLOGY DIRECTOR, CONVERTER



Conclusions

and Recommendations

Source reduction goals stipulated within existing and proposed legislation face an uphill battle despite everyone's desire to optimize packaging. Future legislation to incentivize source reduction must be based on data insights with consideration for how this data will be collected and reported. Finally, source reduction initiatives must be balanced with other sustainability goals like recyclability, increased recycled content and reduction of GHG emissions.

Smithers estimated US packaging volume has decreased from 88.4 million metric tons to 83.5 million metric tons from 2019 to 2024. This has been achieved through a wide range of initiatives including changes in packaging materials, packaging redesigns, supply chain improvements and new material innovations. Companies have also established more robust, accurate and comprehensive methods for tracking source reduction. Industry believes further progress is possible but needs to be considered in the context of what has already been achieved.

It will also require radical innovation and broad collaboration. Smithers estimates that by 2029 packaging volumes will be between 82 million metric tons and 92 million metric tons. This assumes population growth to 347 million people, GDP of 2.7% over the forecast period and e-commerce growth of 5% and is contingent on addressing a range of industry, technology and legislative challenges. To achieve optimal levels of source reduction and deliver against broader sustainability goals, companies and regulators should consider the following recommendations:

1. Source reduction initiatives must be balanced with other sustainability goals like recyclability, increased recycled content and reduction of GHG emissions. Companies need to balance their sustainability objectives with ensuring that packaging continues to provide consumers with safe, functional and affordable products. Source reduction is only one part of the wider sustainability drive, and there are trade-offs to consider, especially between source reduction and recyclability.
2. Industry will need widespread innovation across the value chain including material science, supply chain and logistics and waste management. Companies are investing in all of these areas to achieve broad sustainability objectives without compromising functionality, safety or affordability for consumers but these are long term strategies that take years to execute.
3. Companies will require consistent legislative support that balances different aspects of sustainability to achieve the best overall environmental outcomes. Future legislation to incentivize source reduction must be based on data insights with a consideration for baselines and how this data will be collected and reported.
4. More collaboration is required on standardizing data, metrics and reporting tools to track source reduction. There is an urgent need to define boundaries and develop systemic reporting mechanisms that can track and provide insight into efforts while reducing duplicative reporting. This needs to factor in key issues like value chain partnerships, product design and new SKU creation. Without this quantifying source reduction will continue to be a significant challenge.
5. Refillable and reusable packaging challenges will need to be addressed to have a meaningful impact on packaging source reduction. While these options hold a lot of promise in some markets to enable further source reduction, early pilots and initiatives have proved challenging. The reverse supply chain requirements, food safety concerns and consumer education remain substantial barriers to widespread adoption.
6. Recycling infrastructure investment will need to continue and accelerate to widen the range of accepted materials. Further breakthroughs in new recycling technology will be necessary to achieve material performance requirements and higher rates of circularity.


SMITHERS